NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

Wildlife Wetland Habitat Management

(acre)

Code 644

DEFINITION

Retaining, developing, or managing habitat for wetland wildlife.

PURPOSES

To maintain, develop, or improve habitat for waterfowl, shorebirds, fur-bearers, or other wetland associated fauna and flora.

CONDITIONS WHERE PRACTICE APPLIES

On or adjacent to wetlands, rivers, lakes and other water bodies where wetland associated wildlife habitat can be managed.

This standard will **not** be used to create, restore or enhance wetlands.

One or more of the following NRCS Standards may be used when developing wetlands:

- Shallow Water Management For Wildlife (646) used for developing shallow water on agricultural fields and moist soil areas.
- Wetland Enhancement (659) intended to rehabilitate a degraded wetland where specific functions and/or values are enhanced beyond original conditions.
- Wetland Creation (658) for creating a wetland on a site location that historically was not a wetland, and
- Wetland Restoration (657) intended to rehabilitate a degraded wetland where the soils, hydrology, vegetative community, and biological habitat are returned to original conditions

GENERAL CRITERIA APPLICABLE TO ALL PURPOSES

Plans and application of wetland habitat management shall comply with all applicable federal, state, and local laws and regulations.

Identify species management goals and objectives. For the desired species, identify the types, amount, and distribution of habitat elements and the management actions necessary to achieve the management objectives.

No management action will be taken that will negatively impact or affect (a) unique wetlands and functions or (b) threatened or endangered species.

Native plants will be used wherever possible.

Habitat Elements

The following elements will be evaluated when assessing wildlife habitat. Not all may apply to every habitat type.

1. Food
   a. Type
   b. Amount
2. Cover
   a. Type - nesting, brood rearing, resting/roosting, protection/escape, and winter.
   b. Amount
   c. Quality
3. Water
   a. Quality
   b. Quantity
   c. Accessibility
   d. Seasonal availability
4. Interspersion and Distance to
   a. Crops
   b. Grasses and or legumes
   c. Shrubs
   d. Trees
   e. Water
   f. Openings
5. Migration
   a. Routes
   b. Season of use
   c. Corridors

The amount and kinds of habitat elements planned, their location, and management shall be identified in a management plan.

Biological control of undesirable plant species and pests (e.g., using predator or parasitic species) shall be implemented where available and feasible.

Management measures shall be provided to control invasive species and noxious weeds on a "spot" basis.

Additional Criteria for Waterfowl

The following items will be designed when waterfowl use of the wetland is the primary purpose:

1. Livestock will be excluded from the impoundment with an ungrazed band at least 50 feet wide established around the circumference of the wetland to create a protected edge area for nesting and feeding.

2. At least 20 percent of the pool area at the design level will have a minimum water depth of 3 ½ feet to retard excessive growth of aquatic emergent plants and help to assure permanent water.

3. At least 50% of the pool area will have water less than 18 inches deep

Additional Criteria for Shorebirds

When shorebird use is the primary purpose:

1. Maximize the areas of very shallow water flooding (0 to 4 inches).
2. Maximize the area of mudflats during migration periods.

If food availability is a primary concern:

1. Flooding will be maintained throughout the winter for chironomids and other invertebrates to assure survival of larvae over winter.
2. Foraging habitat will be provided during fall migration by shallow re-flooding of disked, mowed, or harvested fields.

Additional Criteria for Fur-Bearers

The following items are required when furbearer use is the primary purpose:

1. For muskrats the water level shall be maintained at 6 to 12 inches during the growing season to encourage cattail, bulrush, bur reed, arrowhead, and other important food plants.

2. The wetland area will be flooded in the fall, except when winter drawdown is necessary to aid in trapping or to control muskrat damage to dikes.

3. If water control is not possible, at least 20 percent of the pool area will be a minimum of 3 ½ feet in depth at design level.

Additional Criteria for Reptiles and Amphibians

The following items will be followed when reptile and amphibian habitat is the primary purpose of wetland management:

1. Follow the planning guidelines for amphibians and reptiles in Indiana Biology Technical Note No. 1 "Using Micro and Macrotopography in Wetland Restoration".

2. Macrotopographic basins will be designed to keep water available until at least mid-July.

3. Macrotopographic features will constitute between 30-50% of the wetland area.

Additional Criteria for Vegetation

The vegetation shall be established, as close to the original natural plant community as the site conditions will allow. Determination of the original plant community's species and percent composition shall be based upon reference wetlands of the type being restored or suitable technical reference.

In normal situations, rely on existing seed banks in the soil and seed colonization from nearby wetlands to revegetate the wetland.

When regeneration of vegetation is unlikely to occur within 3 years, a planting plan will be developed.

If there are special circumstances that would require planting the wetland, the vegetation selected should be compatible with the planned hydrologic condition. Examples of special circumstances would include restoring an isolated wetland that has been in crop production for many years or where there is a high probability that non-native or aggressive plant species will invade a restoration site.

Plantings, seeding, or other types of vegetative establishment will be comprised of native species that occur on the wetland type being restored. Refer to tables 1 and 2 for shrub and tree species.

Where planting of herbaceous vegetation is necessary, only local genotypes of native species will be utilized when practicable.

Table 1. Shrub List

Common Name *Scientific Name*	*Soil Moisture Tolerance	Average Mature Height (ft.)	Wildlife Information	General Comments
Alternate Leaf Dogwood *Cornus alternifolia*	SPD – WD	18	Fruit eaten by birds. Twigs browsed by deer and rabbits.	Blue-black fruit with red stems. Leaves not opposite.
Black Chokeberry *Aronia melanocarpa*	SPD – WD	10	Fruit eaten by songbirds.	Fruit 1/3" long, dark-purple.
Bladdernut *Staphylea trifolia*	SPD – WD	10	Thicket forming cover provides habitat.	3 lobed balloon like capsule.
Buttonbush *Cephalanthus occidentalis*	VPD – SPD	5	Seeds consumed by many bird species.	Nutlets, best on wet sites. Wilted leaves may be toxic to livestock.
Devils Walking Stick *Aralia spinosa*	SPD - MWD	20	Fruit eaten by birds.	Stout stem with spines, showy white flowers that produce a black drupe.
Eastern Wahoo *Euonymus atropurpureus*	SPD – WD	12	Fruit eaten by birds.	4 lobed red capsules, sometimes winged stem.
Elderberry *Sambuscus canadensis*	VPD – WD	9	Fruit eaten by many birds including pheasant, dove and turkey. Plant contains hydrocyanic acid. Recommended for quail.	Purple-black drupe used for jams, jellies, pies, and wine.
Gray Dogwood *Cornus racemosa*	SPD – WD	8	Fruit eaten by pheasant.	Red pedicles in winter, white drupe.
Hazel Alder *Alnus serrulata*	VPD – WD	18	Deer browse on the twigs.	Prefers wet to moist soils. Long lenticels on the stem.
Highbush Cranberry *Viburnum trilobum*	VPD – WD	9	Fruit eaten by pheasant and songbirds.	Tart red fruits. Showy.
Indigobush *Amorpha fruticosa*	VPD – WD	6		Small pods, flowers purplish spikes.
Nannyberry *Viburnum lentago*	SPD – WD	18	Fruit eaten by songbirds.	Blue-black fruits similar to raisins.
Ninebark *Physocarpus opulifolius*	VPD – WD	10	Fruit are small dry bladders lasting through winter.	White to pinkish flowers.
Pawpaw *Asimina triloba*	SPD – WD	20	Fruit eaten by opossum, squirrels, raccoon and fox.	Large leaves, likes deep moist soils.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Common Name *Scientific Name*	*Soil Moisture Tolerance	Average Mature Height (ft)	Wildlife Information	General Comments
Prickly Ash *Xanthoxylum americanum*	SPD – WD	9	Thicket forming cover provides wildlife habitat.	A thicket-forming shrub with prickly leafstalks. Fruits are a small reddish-brown pod. Chewing plant parts was once a popular toothache cure.
Red Osier Dogwood *Cornus stolonifera*	VPD – WD	10	Fruit eaten by songbirds and quail. Twigs browsed by deer, rabbits.	Reddish stem, white drupe, good winter color.
Rough Leaved Dogwood *Cornus drummondii*	PD – WD	18	Fruit eaten by songbirds, quail, turkey and pheasant. Browsed some by rabbits and deer.	White drupes.
Shrubby St. Johnswort *Hypericum prolificum*	SPD – WD	6	Wildlife cover, forms low dense thickets.	Bright yellow flowers, 3-valved capsule.
Silky Dogwood *Cornus amomum*	VPD – WD	10	Sometimes browsed by rabbits and deer.	Bluish fruit, likes moist soils and partial shade.
Spicebush *Lindera benzoin*	VPD – WD	9	Twigs and fruit eaten by songbirds, deer, rabbit, opossum, quail.	Small red drupe.
Spirea *Spiraea alba* *Spirea tomentosa*	VPD – WD	4	Spirea buds eaten by and twigs browsed by deer and rabbits.	Pink flowers. Also called Meadowsweet or Hardack.
Wild Sweet Crabapple *Malus coronaria*	SPD – ED	30	Recommended for quail.	Yellow-green edible fruit with highly fragrant flowers.
Winterberry *Ilex verticillata*	VPD – SPD	10	Red fruits used as an emergency food source for wildlife.	Erect shrub with small greenish white flowers and bright red berries that persist through winter. Must have male and female plants for pollination.
Witch-hazel *Hamamelis virginiana*	SPD – WD	18	Seeds, buds and twigs eaten by deer, rabbit, quail and pheasant.	Pale yellow flowers that produce pods with seeds.

* KEY: ED = Excessively Drained
WD = Well Drained
MWD = Moderately Well Drained
SPD = Somewhat Poorly Drained
PD = Poorly Drained
VPD = Very Poorly Drained

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Table 2. Tree List

Common Name ***Scientific Name***	***Soil Moisture Tolerance**	**Average Mature Height (ft.)**	**Wildlife Information**	**General Comments**
American Hornbeam *Carpinus caroliniana*	SPD - ED	20	Seeds and catkins consumed by songbirds and squirrels.	Shrub or small tree in the birch family. Also called muscle wood due to the smooth gray, striated bark. Common in floodplains.
American Sycamore *Platanus occidentalis*	PD - WD	90	Sycamore does not have much food value to wildlife; however, this species forms an important structural component of bottomlands and floodplains.	The sycamore is one of our largest trees capable of obtaining heights of over 100 feet. Attractive multicolored bark.
Ash, Green *Fraxinus pennsylvanica*	VPD - WD	60	Seeds eaten by squirrels, quail, and songbirds.	Medium sized tree, which is a common component of swamps and floodplains.
Baldcypress *Taxodium distichum*	VPD - WD	80	Waterfowl occasionally consume seeds. Trees also serve as perching areas for song and wading birds.	The baldcypress is one of two deciduous conifer trees native to Indiana. Perhaps the most flood tolerant of our trees. Often forms an attractive elliptical crown.
Beech, American *Fagus grandifolia*	SPD-WD	75	Nuts consumed by turkeys, deer, and squirrels.	Extremely shade tolerant species with decorative smooth gray bark.
Birch, River *Betula nigra*	VPD - WD	50	Stands of birch serve as important cover for riparian dwelling animals.	Small to medium sized tree of floodplains. Attractive cinnamon colored, exfoliating bark.
Black Gum *Nyssa sylvatica*	PD – WD	60	Fruits consumed by songbirds, turkeys and pileated woodpeckers.	Medium sized tree, which thrives in both upland and wetland conditions. Foliage turns an attractive red color in fall.
Buckeye, Ohio *Aesculus glabra*	SPD-WD	60	Nuts sparingly consumed by eastern fox squirrels.	Fast growing species. Twigs poisonous to livestock.
Catalpa *Catalpa speciosa*	PD – WD	50	Trees provide cover for a variety of wildlife.	Medium sized tree with large heart shaped leaves and cigar like fruits.
Cedar, Eastern Red *Juniperus virginiana*	SPD-ED	45	Berries consumed by songbirds.	Small coniferous tree tolerant of dry, sterile soils.

Common Name *Scientific Name*	*Soil Moisture Tolerance	Average Mature Height (ft.)	Wildlife Information	General Comments
Hackberry *Celtis occidentalis*	SPD – WD	50	Fruits are sparingly consumed by songbirds, including cedar waxwings, mockingbirds, and robins, throughout winter.	Small to medium sized tree of calcareous soils and floodplains. The taste of the fruits may be likened to dates, but contain a large seed.
Hawthorn, Cockspur *Crataegus crus-galli*	ED – SPD	30	Fruits make up an important winter food source for many species of songbirds. Fruit eaten by deer, fox, rabbit, and pheasant. Excellent nesting habitat for songbirds.	Large shrubs or small trees that usually bare stout spines. Attractive white flowers yield small, apple like fruits. Common in disturbed woodlands that had previously been pasture.
Hawthorn, Washington *Crataegus phaenopyrum*	ED – SPD	30		
Hawthorn, Green *Crataegus virdis*	ED – SPD	30		
Hickory, Bitternut *Carya cordiformis*	SPD – WD	50	The nuts of these species constitute an important food source for squirrels. Wood ducks and wild turkeys also consume a significant quantity of these nuts.	Medium sized tree of moist woodlands. Winter buds are sulfur-yellow. The common name is derived from the bitter taste of the nut.
Hickory, Shellbark *Carya laciniosa*	VPD – WD	70		Much like shagbark hickory, but more frequent in poorly drained soils.
Kentucky Coffeetree *Gymnocladus dioicus*	SPD – WD	50	Fruits relished by squirrels, opossum, raccoon and songbirds.	Uncommon, medium sized tree with gray, scaly bark. Fruit a thick, brown pod.
Maple, Black *Acer nigrum*	MWD – WD	70	Samaras are widely consumed by birds and squirrels. Browsed by deer.	Medium sized tree very similar to sugar maple, but usually found in moister soil conditions. The leaves tend to be mostly 3-lobed.
Maple, Red *Acer rubrum*	VPD – WD	70		Characteristic medium sized tree of swampy areas, but also found in upland conditions. Leaves turn an attractive scarlet red in fall.

Common Name ***Scientific Name***	***Soil Moisture Tolerance**	**Average Mature Height (ft.)**	**Wildlife Information**	**General Comments**
Mulberry, Red *Morus rubra*	SPD-WD	40	Purplish fruits preferred food source of birds and small mammals.	Small tree. Fruits edible and used in jellies, jam, and pies.
Northern White-Cedar *Thuja occidentalis*	PD – WD	40	Foliage often browsed by deer in late winter as an emergency food source.	This medium sized evergreen was once common in northern Indiana bogs. Attains best form on calcareous soils. Commonly planted ornamental.
Oak, Bur *Quercus macrocarpa*	PD – ED	80	The smaller pin oak acorns are particularly favored by wood ducks.	Medium to large sized tree, which grows most typically in mesic woodlands and along floodplains, but is also very drought and fire tolerant. Large acorns with fringed caps.
Oak, Cherrybark *Quercus pagoda*	SPD – WD	75		Large tree of bottomlands and well-drained soils. In Indiana, found only in the extreme southwestern part of the state.
Oak, Pin *Quercus palustris*	VPD – WD	75		Common medium sized oak of poorly drained soils and floodplains. Dead branches are seldom shed from the trunk of this species giving it a characteristic appearance.
Oak, Shingle *Quercus imbricaria*	SPD – WD	50		Small to medium sized tree of mesic woodlands. Leaves remain on tree through winter, but unlike other oaks, the leaves of this species are unlobed.
Oak, Shumard *Quercus shumardii*	SPD – WD	75		Large sized tree of well-drained soils and bottomlands. Closely resembles red oak, but usually occurs in a lower position on the landscape.

Common Name *Scientific Name*	*Soil Moisture Tolerance	Average Mature Height (ft.)	Wildlife Information	General Comments
Oak, Swamp White *Quercus bicolor*	VPD – WD	70	Large acorns consumed by many wildlife species.	Medium sized tree of poorly drained soils. The specific name, bicolor, refers to the two toned leaves which are dark and shiny above, and dull and white below.
Pecan *Carya illinoensis*	SPD-WD	120	Ellipsoid nuts readily consumed by a variety of wildlife.	Large tree with sweet edible nuts.
Persimmon *Diospyros virginiana*	SPD – WD	50	Raccoons as well as some songbirds readily consume the large berries.	Small tree found in bottomlands and old fields. Fruit, a large berry, is edible when ripe.
Sweetgum *Liquidambar styraciflua*	PD – WD	85	Seeds consumed by "northern" finches in winter.	Large tree common in bottomlands of southern Indiana. Leaves are palmately five-lobed. Fruit is a prickly ball with multiple capsules.
Tamarack *Larix laricina*	VPD – SPD	60	Seeds consumed by "northern" finches in winter.	Small to medium sized tree found in northern Indiana bogs and swamps. The only deciduous member of the pine family found in Indiana. Small cones grow upright along twigs.

* KEY: ED = Excessively Drained
WD = Well Drained
MWD = Moderately Well Drained
SPD = Somewhat Poorly Drained
PD = Poorly Drained
VPD = Very Poorly Drained

CONSIDERATIONS

Consider developing wildlife wetland habitat management plans with the assistance of a professional biologist when a plan is large or complex.

Consider an interspersion of 50% open water and 50% emergent cover when general wildlife diversity use is the primary purpose.

Consider avoiding large fluctuations in water level to minimize flooding of muskrat dens when furbearer use is the primary purpose.

Consider water level manipulation to manage vegetative composition and to expose mudflats or for food plot establishment.

Consider following the planning guidelines for the appropriate species of concern in Indiana Biology Technical Note No. 1 "Using Micro and Macrotopography in Wetland Restoration".

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Consider placing loafing logs, stumps and other woody debris in the wetland for amphibians and reptiles.

Consider constructing artificial nesting boxes for wood ducks if natural tree cavities are lacking and for mallards if upland nesting cover is lacking.

Consider constructing logs or rafts, bales of hay or straw, or rocks piled in shallow water to be used as loafing sites by waterfowl.

Islands can be constructed to provide loafing, resting and nesting sites. Islands should be at least 15 feet in width and be 2-4 feet above normal water level in the wetland area. Islands of oblong shape parallel with water flow are desired. Island should have at least a 6-foot top. At least one-fourth of the side slope should be 6:1 or flatter.

Consider disking areas of exposed, emergent and submergent vegetation during late winter or fall draw downs to set back vegetation and provide exposed soils (mudflats) for migrating shorebirds.

Consider planting buffer areas to warm season grasses to encourage waterfowl nesting using NRCS Standards Upland Wildlife Habitat Management (645) or Filter Strip (393).

PLANS AND SPECIFICATIONS

Plans and specifications for this practice shall be prepared for each site. Plans and specifications shall be recorded using approved specifications sheets, job sheets, and narrative statements in the conservation plan or other documentation.

Planting plans for herbaceous plants, shrubs and trees will include, as a minimum: species, density and planting techniques.

OPERATION AND MAINTENANCE

The following actions shall be carried out to insure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance).

The use of fertilizers, mechanical treatments, prescribed burning, pesticides or other chemicals to assure the wetland restoration function shall not compromise the intended purpose.

Include management needed to maintain vegetation, including the control of unwanted and exotic vegetation.

The timing and level setting of water control structures required for the establishment of desired hydrologic conditions or for management of vegetation shall be included.

An inspection schedule for embankments and structures for damage assessment shall be included.

The designed acceptable amount of sediment accumulation to be allowed before removal is required.

Haying and livestock grazing is not a compatible use.

REFERENCES

Deam, Charles C. 1932. *Shrubs of Indiana, 2nd* edition. State of Indiana Department of Conservation, Indianapolis, IN.

Deam, Charles C. 1953. *Trees of Indiana 3rd* edition, reprinted 1995. State of Indiana Department of Conservation, Indianapolis, IN.

Payne, Neil F. 1992. *Techniques for Wildlife Habitat Management of Wetlands.* McGraw-Hill, Inc. 549pp.

Kusler M. and Kentula, eds. 1990. *Wetland Creation and Restoration: The Status of the Science.* Island Press. 616pp.

Midwestern Wetland Flora: Field Office Guide to Plant Species. U.S.D.A. Soil Conservation Service, Midwest National Technical Center, Lincoln, Nebraska. No date.

Harlow, William M., E.S. Harrar, J.W. Hardin, and F.M. White. 1991. *Textbook of Dendrology: covering the important forest trees of the United States and Canada,* 7th ed., McGraw-Hill, New York.

Martin, A.C., H.S. Zim, and A.L. Nelson. 1951. *American Wildlife and Plants: A Guide to Wildlife Food Habits*, Dover, New York.

Peattie, D.C. 1948. *A Natural History of Trees: of Eastern and Central North America*, 2nd ed., Bonanza, New York.

U.S. Department of Agriculture Natural Resources Conservation Service, Engineering Field handbook, Chapter 13, *Wetland Restoration, Enhancement, or Creation*, 1992.

U.S. Department of Agriculture Natural Resources Conservation Service, *Indiana Biology Technical Note No. 1 - Using Micro and Macrotopography in Wetland Restoration, 2000.*

U.S. Department of the Interior Fish and Wildlife Service, *Waterfowl Management Handbook*, 1988.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.